BY MARTIN L. MARIMONT

GNP by Major Industries

Comparative Patterns of Postwar Growth

DURING the postwar period, all industry groups in the economy participated in the upward sweep of the gross national product. However, the industry groups differed markedly in the extent to which they shared in the 1947–61 expansion, when the real volume of GNP rose by 60 percent. Finance and insurance, communications, and public utilities were the leading gainers, while the farm and transportation industries were among those making the smallest contributions to the overall increase in real GNP.

The differential patterns of postwar economic growth, which hitherto could be observed only in terms of the current-dollar national income figures, can now be analyzed into real volume and price components, with the aid of the new data that underlie this report.

Since prices were rising in the postwar period, the increase in current-dollar GNP was larger than in real output—the 1961 current-dollar GNP totaled almost $519 billion, more than double the $234 billion figure for 1947. The long-term advances varied considerably among major industries, as did the year-to-year changes. Above-average increases in prices occurred in contract construction, services, and general government; prices declined for farms and public utilities.

The cost structure of GNP originating in private business shifted over this period, as payroll costs and capital consumption allowances increased more rapidly than prices, and profit margins remained stable. (Total profits increased, of course, with the growth in the volume of production.) This shift occurred in most major industries comprising the private business group. However, the profit experience of the more rapidly growing industries was relatively more favorable.

These are among the highlights emerging from a major expansion of the national accounts, consisting of a breakdown of the GNP into industry components undertaken by the Office of Business Economics. The work was planned to accomodate the special requirements of the Interagency Project on Economic Growth and Employment Opportunities.

New Set of GNP Accounts

THIS article presents a new set of accounts on the measures of the physical volume of the gross national product originating in the various industries of the Nation, which in principle aggregate to the physical volume of GNP as calculated by summing the various types of expenditures for final output, corrected for price change.

Current-dollar gross national product can be broken down on an industry basis by adding to the existing series of national income originating in each industry its share of indirect business taxes, capital consumption allowances, and a few other items that reconcile the national income and the GNP concepts. However, these income and related items cannot be converted into physical volume terms directly; appropriate techniques for doing so are not available. Indirect methods must be used.

The gross product of each industry in terms of income shares and related items is equal to the difference between its total sales (including inventory change) and its purchases of raw materials and other current account items from other industries. This alternative definition of industry gross product provides the means to convert current-dollar industry product into constant dollars: Separate constant-dollar measures of sales (including inventory change) and current account purchases for each industry are calculated by the ordinary methods of price deflation, and the difference between these two series yields constant-dollar industry gross product. This basic method or variants of it were applied to industries accounting for about one-half of the total GNP; for industries comprising the rest of the economy approximations relying mainly on deflated industry sales (plus inventory change) were utilized.

These measures of the physical volume of GNP originating in the various industries of the Nation are discussed in the first part of this report.

Next, industry "price" deflators of the gross national product originating in each industry were constructed by dividing the current-dollar gross products by the corresponding physical volume measures. These indexes measure the percent that the gross product—sales minus purchases—of an industry in a given period is compared to the gross product which the same composite

NOTE.—George R. Kruer had a major part in developing the basic estimates and assisted in the preparation of this report. Acknowledgment should also be made to a paper by J. Alterman and E. E. Jacobs, "Estimates of Real Product in the United States by Industry Sector, 1947–57", in *Studies in Income and Wealth*, Volume 25, Princeton, 1961.

of sales and purchases would have yielded in the prices of the base period. They can be regarded as measuring the prices of the real product or value-added contributed by the factors of production engaged in each industry. (A numerical example of this type of calculation is provided in the appendix.)

The differential movements in these industry implicit price deflators are discussed in the second part of the article.

The current-dollar industry gross product which served as the numerator in deriving the industry deflators can be broken down into the major elements of costs—employee compensation, interest, capital consumption allowances and indirect business taxes on the one hand, and profits (including both corporate and noncorporate earnings) on the other. It is then possible to analyze the industry price indexes into the number of points contributed by each of these major cost and income components to the total industry index. This is done by dividing each of these components by the same constant-dollar figure of industry output which was used to derive the overall industry implicit price index.

This calculation provides succinct summaries of the cost-price structure of the various industries. These underlie the discussion of the third part of this report.

Industry rise in 1960–61

The real GNP increased almost 2 percent between 1960 and 1961, with gains occurring in all industries except transportation. The rise was generally at a faster pace in the service-type industries. The increases in the commodity producing and distributing industries were less rapid since during the early months of 1961 they were at a cyclical low. The industry gross product totals, in 1954 prices, are shown in the preceding table for 1960 and 1961. The 1961 estimates are based upon incomplete statistical information and summary estimating techniques.

Industry	Gross Product (Billions of 1954 dollars) 1960	1961
All industries, total (GNP)	440.2	448
Agriculture, forestry, and fisheries	22.7	23
Mining	10.3	11
Contract construction	18.3	19
Manufacturing	128.5	127
Wholesale and retail trade	78.0	79
Finance, insurance, and real estate	54.7	57
Transportation	21.4	21
Communications	9.8	10½
Public utilities	13.8	14½
Services	44.9	46
Government and rest of the world	42.0	43½
Residual	−2.4	−3½

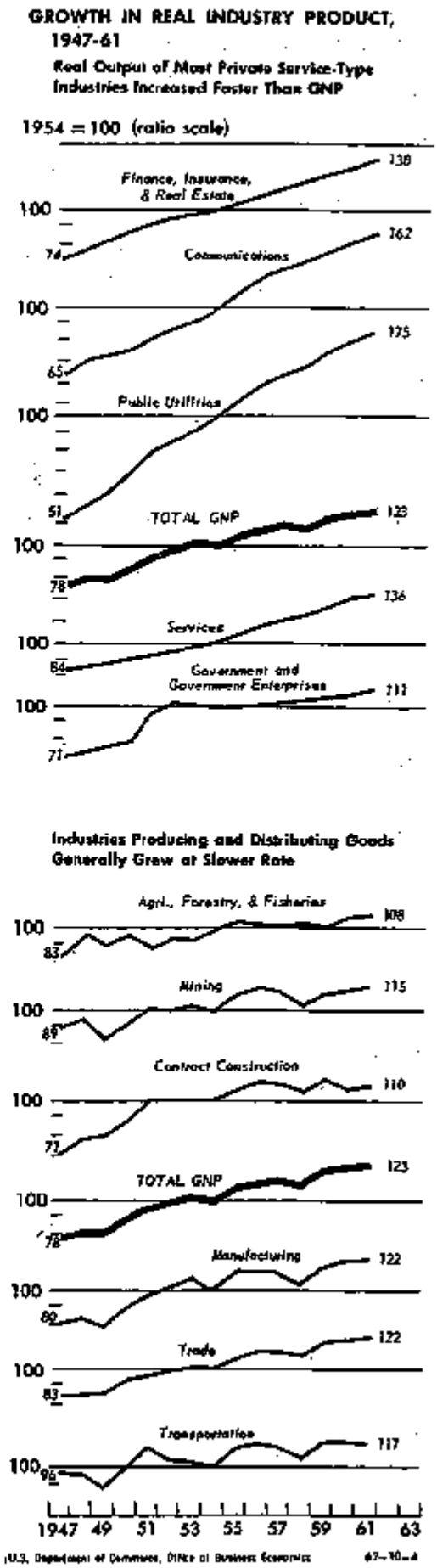
Trends in Real Gross Product by Industry

For each of the broad industry groups distinguished, real gross product increased from 1929 to 1961. As table 1 shows, annual increases in the earlier part of the postwar period were especially large but in recent years the rate of expansion has slowed considerably. This pattern can be seen in most of the industries. For the postwar period as a whole, the average annual rate of increase has exceeded that of 1929–61; at the beginning of the postwar period output was under the influence of the dislocations caused by World War II.

Private service-type industries

While each of the broad industrial groups of the economy participated in the postwar expansion, the increases have varied widely. By far the largest gains in output were recorded by public utilities and communications. (See chart on this page.) The public utilities industry, which consists predominantly of gas and electric utilities, expanded its output at an annual rate of about 10 percent during 1947–57 and at about 7 percent for 1957–61. The pace in both periods was more rapid than the already better-than-average growth rate achieved since 1929.

Many factors, both social and economic, were responsible for this outstanding performance. Consumer requirements multiplied as the population and the rate of family formation increased and as the standard of living rose markedly. More houses and apartments and more widespread use of appliances increased the consumer market for electric utilities. Furthermore, industry expanded its plant and equipment and introduced major technological innovations which required greatly expanded use of electric power. The rapid growth of the natural gas industry, displacing markets formerly



served by manufactured gas, coal, and petroleum products, is also reflected in this industry's advance.

Communications had the second largest growth during the postwar period. Subject to many of the same forces as public utilities, output of the communications industry grew at about double the overall rate. The major components accounting for this growth were, of course, the telephone industry and radio and television broadcasting. There was a decline in the telegraph industry.

Better than average gains were also marked up by finance, insurance, and real estate. (The latter includes the ownership of residences, which is classified as a business activity in the national income and product accounts.) At the beginning of the postwar period these industries had not yet recovered their earlier position in the economy. Other causes of the subsequent expansion were in this instance also the demands of a growing population magnified by rising standards of living and the requirements of expanding business activity.

Other industries

Several industries did not keep pace with the gains achieved in overall GNP. These included farming, mining, and transportation. Though less than the overall average, the postwar growth of farm gross product has exceeded significantly its earlier increase. Mining output has weakened largely as a result of the reduced demand for coal. Coal as a source of power and heat was unable to meet the strong competition offered by such alternative fuels as petroleum and gas. In addition, technological innovations have brought about substantial economies in mineral fuel consumption in fuel-using industries.

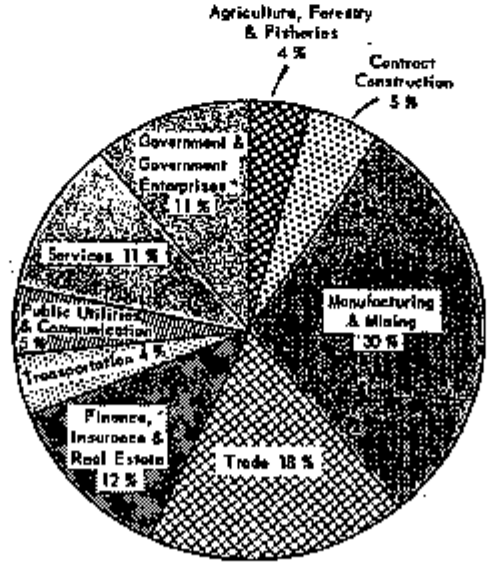
The transportation industries, which had maintained in the 1929–47 period a better-than-average rate of expansion, have since slowed considerably. Transportation output grew at an annual rate of about 4 percent between 1929 and 1947, but declined to only a third of that pace during the postwar period. Major declines in railroads, water transportation and in local and highway passenger transportation partially offset sharp rises in airlines and highway freight. The increased use of privately owned automobiles has, of course, been an important factor affecting this industry.

Government output (general government and government enterprises), which had an above-average rate of increase through 1947, declined to the overall average rate for 1947–57 and then below it for 1957–61. Steady large gains in State and local general government and in government enterprises were offset in part by the smaller rise in Federal general government. However, the analysis must be qualified in the light of the convention adopted in measuring the output of general government, the major portion of the total. In current dollars, gross product originating in general government is measured by the compensation of government employees. (This should be distinguished from the government purchases component of GNP which reflects the use of national output by the government.) To convert the current-dollar government gross product into constant dollars, real output is assumed proportional to the employment input, thus excluding the effect of possible changes in output per employee. This point will be referred to again in the discussion of the implicit deflators.

INDUSTRIAL DISTRIBUTION OF GNP, 1961

Commodity-Producing Industries Account for Nearly 40 Percent of GNP

(Based on current dollar totals)



*Includes rest of the World .5 %

U.S. Department of Commerce, Office of Business Economics 62-10-5

The real gross product of contract construction increased more rapidly than did total GNP from 1947 to 1957, in sharp contrast to its less-than-average pace before that time. From 1957 to 1961 its performance has been below average. Over the entire period since 1929 the output of this industry has not kept pace with the growth of total GNP. Certain weaknesses in the calculations of the real volume of construction, which might understate the performance of this industry, will be noted later.

Manufacturing industries increased more rapidly than total GNP between 1929 and 1947.[1] The 1947–57 rate of increase was higher than for the preceding years, but below the rate for the economy as a whole. In this period the durable goods industries increased somewhat more rapidly than the nondurables. For 1957 to 1961 the annual rate of expansion for total manufacturing declined, as for most industries, and was lower than the national average.

Industry composition changes little 1947–61

Recently about 30 percent of the volume of gross national product originated in manufacturing industries. Trade activity was a somewhat distant second, originating 18 percent of the total, followed by finance, insurance, and real estate, services, and government, each with about one-tenth of total GNP. These five activities represented four-fifths of all goods and services produced.

This pattern is substantially the one that prevailed in 1947, with a few exceptions in the smaller groupings; these reflect the industry departures from the average growth rate that have just been discussed. Agriculture declined from about 6 percent to 5 percent, as did transportation. Communications and public utilities, which together accounted for 3 percent of total GNP in 1947, had risen to beter than 5 percent recently.

1. The appendix contains a comparison of the index of real gross product originating in manufacturing and the FRB index of manufacturing production.

Comparison with 1929 brings to light more significant shifts. While manufacturing also held first place in that year, its share amounted to 25 percent in 1929, 5 points lower than in the postwar years. The share of government rose from about 7 percent to 11 percent over this period. Another significant postwar gainer was communications and public utilities which originated only 2 percent of GNP in 1929 and is better than double that proportion currently. Agriculture's share of total gross product has dropped sharply since 1929, from 9 percent of the total to only 5 percent.

This discussion has been in terms of the real volume of GNP; the accompanying chart, it should be noted, is based on current dollars.

Cyclical sensitivity marked

There was diversity also in the short-term, or essentially cyclical, movements of real product. The short-term industry patterns fall into two broad categories. One covers activities which usually show marked sensitivity to changes in the business cycle. Included are those associated with the production and distribution of goods—such as manufacturing, mining, construction, trade, and transportation. The other category shows little response to the successive phases of the cycle. This grouping consists of the industries which in the main provide services—including communications, public utilities, services, finance, insurance, and real estate, and government. In most of these cases the underlying expansionist forces during the postwar period were so strong that they overrode or markedly lessened cyclical influences.

Table 1.—Average Annual Percent Change in Real Gross Product by Industry, Selected Periods, 1929–60

	1929–60	1929–47	1947–60	1947–57	1957–60
All industries, total (GNP)	2.9	2.5	3.5	3.5	2.5
Agriculture, forestry and fisheries	1.1	.4	1.9	2.0	1.8
Mining	1.3	.9	1.9	2.8	−1.2
Contract construction	2.1	1.2	3.4	4.7	−.7
Manufacturing	3.3	3.4	3.2	3.0	2.1
Wholesale and retail trade	2.7	2.5	2.9	3.0	2.5
Transportation	3.1	4.2	1.0	1.3	1.1
Communications and public utilities	5.5	4.1	3.3	3.5	4.6
Finance, insurance, real estate and services	2.6	1.5	4.1	4.0	4.3
Government and government enterprises	3.9	4.3	3.3	3.8	1.5

Figures show the average annual compounded rate of change between the initial and terminal years of each period.

NOTE.—Based on constant (1954) dollars. Data for 1929 derived from John W. Kendrick, *Productivity Trends in the United States*, Princeton, 1961.

Source: U.S. Department of Commerce, Office of Business Economics.

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In this discussion of cyclical industry responsiveness, two data limitations should be kept in mind. First, only annual totals are available in the real product calculations. A time span of such length tends partly to obscure the timing of the cyclical turning points and the extent of the cyclical swings. Second, because of estimating errors, the sum of real product originating in the various industry groups differs somewhat from the regularly published GNP totals. (See table 4.) Consequently, when year-to-year changes are small, some uncertainty is introduced, limiting the precision with which the shifts can be traced at the industry level.

The first postwar dip in total GNP occurring in 1949 was very mild. Industrially, the principal area of decline was manufacturing—especially the durable goods industries. The associated decreases in transportation, centering in railroads, and in mining and farming accounted for all of the remaining downward movement. Production in all the other industries was maintained or rose, limiting the extent of the decline.

In the ensuing recovery and expansion all activities participated to carry the economy to a new peak in 1953. Manufacturing was the principal contributor to this gain, accounting for better than two-fifths of the increase, considerably more than its proportionate share of total GNP. As would be expected, sharp rises in durable goods production were the principal factor.

Manufacturing industries, continuing their role as the most volatile element, led the retreat from the 1953 highs. The manufacturing decline was larger than the total drop. Trade, transportation, mining, and production originating in the Federal Government also turned down but by smaller amounts.

The economy reached a new high in 1957. The manufacturing upturn was less vigorous than in the post-1949 expansion, adding only proportionately to the overall increase.

In 1958 all activities concerned with the production and handling of goods, except farms, were set back from their 1957 levels. The loss in the durable goods manufacturing industries alone nearly equaled the drop in the physical volume of total GNP. Continuing increases in the service-oriented industries, however, cushioned the extent of the overall decline.

Output for the economy as a whole rose sharply from 1958 to 1959; the increased pace continued into early 1960, and a new high was touched in that year. However, only modest gains were made for 1960 as a whole, as activity turned down in the latter half of the year. In the 1959–60 upturn, manufacturing showed a less-than-average increase. The major areas of strength were again the service-associated industries; notably large gains occurred in public utilities and communications. (Developments for 1960 to 1961 have been discussed earlier in this article.)

Industry Gross Product Deflators

As already explained, implicit deflators for each industry have been calculated by dividing gross product in current prices by gross product in 1954 prices, and expressing the quotients in terms of 1954=100.

These implicit deflators, as previously noted, take into account not only the change in the selling prices of an industry but also the change in the prices of the purchased materials and other intermediate products which it buys. In effect, the change in buying prices is netted out from the change in selling prices. If, for instance, the selling prices of an industry increase 100 percent, and the increase in buying prices is larger, the implicit deflator for that industry will increase less than 100 percent.

With respect to selling prices, we are dealing not only with wholesale prices in markets for intermediate products but also with prices of final products. These include retail prices, construction prices, wholesale prices in instances in which final purchases are made in wholesale markets, and specially developed price measures—such as in the case of the general government.

Inasmuch as the prices of intermediate goods cancel out in the calculation of the overall industry average, the all-industry implicit deflator is in principle the same as the implicit deflator for GNP by type of final expenditure. The latter is an average of final product price indexes, with weights proportional to final expenditures on the various types of goods and services.

Most deflators rise

A large part of the postwar increase in current-dollar GNP was the result of price rises. The implicit deflator for GNP as a whole rose from 83 (1954=100) in 1947 to about 116 in 1961—an increase of about two-fifths—touching a new peak at the end of the period.

The post-1947 price movements occurred in roughly four phases. The period 1947 to 1951 witnessed steeply climbing prices, originating in the pressures of meeting post World War II demands and the needs created by the Korean conflict. From 1952 there was generally a mild upward drift in industry price indexes which lasted until 1956 and 1957 when prices increased sharply in nearly all industries. Since that time price rises have been moderate.

For the entire postwar period, three industries showed increases in their deflators that were far more than the average price change for the entire economy—general government, contract construction, and services, in that order. (See table 2 and chart.)

The size of the increase in the deflators for these three industries is subject to qualifications. The special convention used to measure the real output of general government has already been mentioned. This convention could result in an understatement of government output and in an overstatement of the deflator. A parallel weakness is implicit in most of the basic price indexes used to deflate the components of the construction output series. These indexes refer, in general, to the prices of construction labor and materials. Deflation of the current-dollar construction figures by these indexes results in constant-dollar series that do not reflect increases in construction output per unit of input. A number of the service components have been calculated using similar methods and thus might also fail to give full weight to gains in productivity.

The two industries that moved counter to the general price rise were agriculture and public utilities. The well-known difficulties that beset farming after an unusually prosperous period during the war and the earlier postwar years, depressed the gross product price index for agriculture from 120 in 1947 to 97 in 1961. The public utilities index was relatively stable, dropping 1 point over the postwar period. This small decline occurred despite rate increases during these years. The offsetting factor was the substantial increase in the volume of electricity and gas consumed per customer which was made possible by the tremendous progress in technology. Since the rate schedule provides for a decline in price per unit as volume increases, a significant portion of the additional production was sold at sharply lower prices.

Industry moves during price spurts

As is to be expected, the industries that exhibited the largest postwar price rises also showed more-than-average percentage increases in the years when overall GNP prices increased most. The service industry had above-average increases in each of these years except 1955–56. Construction and government exceeded the average national price rise in each of these periods except 1950–51; finance, insurance, and real estate showed the least consistent pattern.

Other industrial groupings, which had less spectacular price increases for the entire postwar period, nevertheless on occasion showed price rises in the record price change years that exceeded the overall change. Manufacturing contributed disproportionately in the earlier years when the demand for manufacturing products was particularly insistent. Since 1956, below average increases in the prices of nondurable goods manufacturing industries offset the larger-than-average changes for durable goods. Mining and railroads, like manufacturing, experienced large price rises in the first postwar years but not since that time, coincident with a weakening in their market positions. Agriculture, although showing a price decline for the postwar period as a whole, nevertheless contributed disproportionately to the price increases that occurred in the earlier years.

Table 2.—Percent Change in GNP and Industry Deflators, Selected Periods, 1947–60

	1947–60	1947–51	1950–51	1955–56	1956–57	1957–60
All industries, total (GNP)	37.8	15.8	7.5	3.4	3.0	5.5
Agriculture, forestry, and fisheries	−15.7	6.9	22.5	.9	1.8	3.1
Farms	−21.7	6.4	22.8	.5	2.1	1.9
Mining	37.5	29.4	2.9	1.5	−1.7	−1.6
Contract construction	71.3	22.3	6.7	6.0	5.9	11.0
Manufacturing	49.2	18.2	8.0	4.1	3.5	2.5
Durable goods industries	na	24.0	6.2	5.3	5.4	na
Nondurable goods industries	na	13.7	9.7	2.0	.7	na
Wholesale and retail trade	31.9	13.2	11.2	3.5	4.6	5.4
Finance, insurance, and real estate	55.7	18.9	3.6	.9	2.4	7.3
Finance and insurance	59.5	21.9	6.3	−1.2	4.9	12.3
Transportation	31.2	11.7	1.5	1.5	6.4	−.0
Railroads	26.0	24.2	1.8	.2	6.6	−4.4
Communications	33.7	20.1	4.6	.3	2.7	0.4
Public utilities	−1.1	1.9	2.8	−2.5	1.4	−.4
Services	61.4	20.6	3.3	2.8	4.5	7.0
Households and institutions	62.0	18.7	4.1	2.8	3.9	11.1
Government and government enterprises	80.2	18.3	0.7	3.6	6.6	16.0

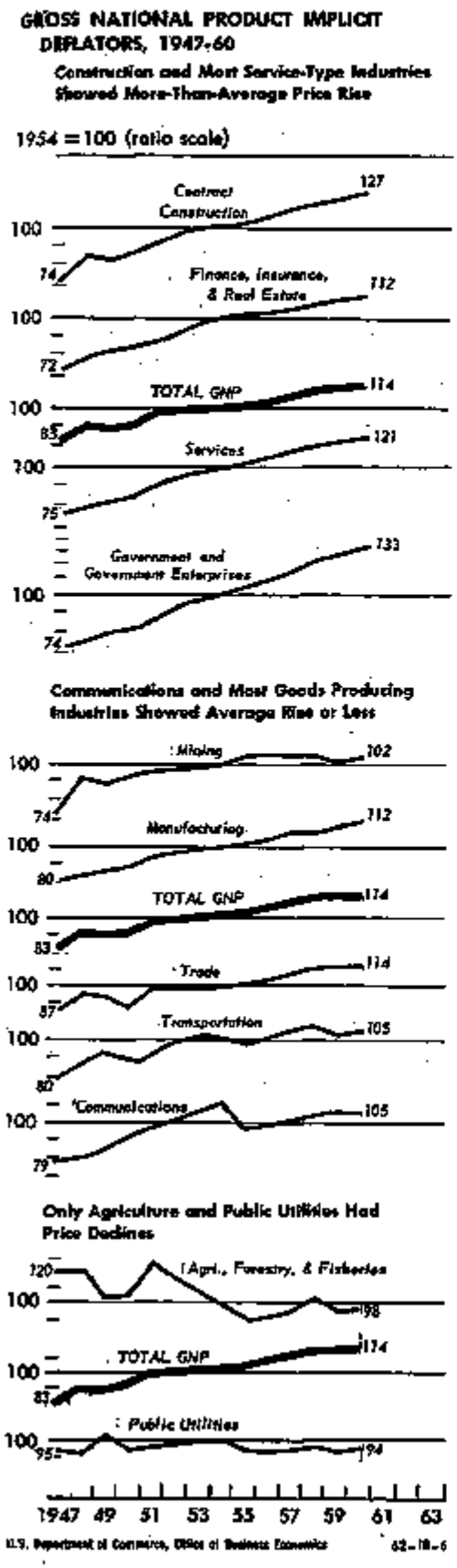
Source: U.S. Department of Commerce, Office of Business Economics.

Changes in Cost Structure

The new series makes it possible to examine the cost-profit structure underlying the industry and overall price indexes.[2]

2. The analysis and statistical methods used for this discussion are based primarily upon studies carried out by Charles L. Schultze, appearing in *Prices, Costs and Output: 1947–57*, published by the Committee for Economic Development and in various reports of the Joint Economic Committee of Congress. Similar methods were followed in "Corporate Profits Since World War II", *Survey of Current Business*, January 1956, by R. D. Gaboon and J. B. Epstein.

As explained earlier, price indexes or deflators for industries and for the nation as a whole have been calculated by dividing current-dollar gross product and its major cost and income components by real gross product. This division yields, in addition to the industry implicit price index, the number of points in the total index associated with the several income and cost items. (See table 3.)



It should be noted that this is only an after-the-fact measurement of the number of price points associated with a component. The fact that points in the price index are attributed to a component share does not mean that they were caused by that share.

If the points calculated for a given component increase over time by a larger percent than for other shares, this indicates that the relative importance of that component in the cost-profit structure has increased disproportionately. The same conclusions regarding changes in the cost-profit structure could be derived from a comparison of changes in the percent distribution of the income share, capital consumption, and business tax components of gross product. The method used here, however, has the advantage of rearranging the conventional components into groupings more directly relevant to cost-price analysis and of condensing into a single set of numbers the changes in the costs associated with a change in gross product prices. The components of gross product are reshaped into costs and profits per dollar of real output by dividing these components by the constant-dollar gross product.

These quotients can be thought of as tracing the prices, costs, and profits per unit of real gross product. For the nation as a whole, such a unit represents one dollar's worth, in base period (1954) prices, of the particular combination of goods and services produced in any given year. For an industry the interpretation is the same, except that reference is now to the particular collection of goods represented by that industry's sales and purchases. It will be noted that this is the conventional market basket interpretation of retail price indexes extended to industries and to the nation as a whole.

Unit costs increase faster than prices

As can be seen from table 3, which contains calculations of the type just described for the economy as a whole, 22 points of the 33 point increase in the GNP deflator between 1947 and 1961 were associated with increases in employee compensation, as payroll costs per unit of output rose somewhat more rapidly than GNP prices. Another 6 points of the overall price increase occurred in allowances for capital consumption, where costs per unit doubled, and 4 points in indirect business taxes where unit costs increased about 65 percent. Net interest per unit of output tripled and was associated with 3 points of the overall price rise.

The remaining income shares, which include mainly corporate profits and proprietors' income, held level per unit of real output over the period as a whole. Needless to say, the total of these incomes increased substantially over the postwar period as the real volume of national production expanded.

Sub-periods varied from the pattern for the entire period. Consider, for example, the events from 1947 to 1951 when aggregate output increased sharply and about 40 percent of the postwar price rise occurred. In this interval, employee compensation per unit of output showed a somewhat smaller rise than did GNP prices. Capital consumption allowances per unit of output increased substantially as heavy new investment in plant and equipment occurred. This new investment reflected prices higher than the prices of the investment goods which it replaced; this added to the increase in depreciation charges. Net interest also increased disproportionately with the expanding financial activity that characterized the postwar period. Profits per unit of output also increased at slightly better than the average rate for prices as a whole.

During the 1951–57 period the economy continued to move forward though at a somewhat slower rate than in the earlier years of the postwar period, and the average increase in overall prices was slower. In this period capital consumption allowances per unit of output continued to increase at a much faster pace than unit prices, with liberalized depreciation allowances an important additional factor in the increase. Interest costs per unit of output also con-

Table 3.—GNP Implicit Price Deflator (1954=100) and Unit Costs and Profits, Selected Periods, 1947–61

	1947	1951	1957	1961	Average annual percent change			
					1947–51	1951–57	1957–61	1947–61
Employee compensation	45.6	52.8	62.5	67.5	3.7	2.9	2.0	2.8
Net interest	1.3	1.9	3.3	4.5	8.4	10.5	8.1	9.3
Capital consumption allowances	4.6	5.4	9.2	10.1	3.6	6.2	2.4	5.8
Indirect business taxes	6.8	7.8	9.5	11.2	3.5	3.9	3.4	3.8
Profit-type income	28.3	27.1	23.7	23.2	−3.9	−2.3	−.5	0
GNP implicit price deflator	83.6	96.2	108.4	116.8	3.8	2.0	1.7	2.4

NOTE.—Employee compensation consists of wages, salaries, and supplements.
Net interest is net interest component of national income.
Capital consumption allowances consists of depreciation, capital outlays charged to current expense, and accidental damage to fixed business property.
Indirect business taxes consists of indirect business tax and nontax liability and business transfer payments.
Profit-type income consists of corporate profits after inventory valuation adjustment, proprietors' income, rental income of persons, and surplus of government enterprises, less subsidies.

SOURCE: U.S. Department of Commerce, Office of Business Economics.

tinued their sharp rise. In contrast to the earlier postwar experience, the percentage increase in unit labor costs was considerably larger than in the total price of final output. Profits per unit of output shrank, although aggregate profits continued to increase with the rise in total production.

From 1957 to 1961 the expansion of aggregate output was small and overall prices rose, but more slowly than in the preceding period. Employee compensation and capital consumption allowances per unit of output rose only moderately faster than GNP prices. Unit interest costs continued their above-average increases. Profits per unit of output tended downward only very slightly.

This discussion of the cost-price structure refers to the economy as a whole; indicated changes reflect in part shifts in the form of legal organization—i.e., shifts among corporations, unincorporated business, households, and government—rather than being confined to changes in the cost structure of each of these segments. With particular reference to the important corporate sector, it may be noted that in the initial period, 1947–51, unit profits increased more pronouncedly in relation to employee compensation than for the economy as a whole. Also, in the last few years, profit margins per unit of corporate output remained stable whereas there was a slight further weakening in all forms of profit—corporate and noncorporate—per unit of total real GNP.

The discussion earlier in this article pointed to the resistance of prices to the downward pressure of recession periods. In the postwar years, the price level has usually increased in downturns; in 1949, there was a barely measurable drop. Following widely recognized patterns, in each recession year the additional price points were associated principally with employee compensation and allowances for capital consumption, while profit margins declined. In the first years of recovery, in contrast, the points of the price increase associated with profits were large.

These cost-profit patterns per unit of output reflect mainly the behavior of the various types of costs in response to cyclical changes in the volume of output. In recessions, when total output shrinks, fixed costs—such as capital consumption allowances, interest, and some indirect business taxes—are spread over a smaller total volume of production, and the cost of these items per unit of output rises. Wages and salaries are more flexible in response to output changes, but they also include a relatively stable element, and labor costs per unit of output tend to rise. Production at less than optimum levels of efficiency may also be a factor in the increase of unit labor costs in business downturns. These several factors making for an increase in unit costs are reflected in a corresponding reduction of profit margins. Aggregate profits decline even more, of course, as a result of the shrinkage in sales volumes.

All these factors are reversed in the ensuing business upturn. Fixed or

Table 4.—Gross Product in Constant Dollars, by Industry

(Billions of 1956 dollars)

	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
All industries, total (GNP)	282.3	293.1	292.7	313.1	341.3	353.5	369.0	363.1	392.7	400.9	408.6	401.3	428.6	440.2
Agriculture, forestry, and fisheries	17.7	20.1	18.2	20.3	18.9	19.7	20.4	21.3	22.3	21.9	21.5	21.3	21.7	22.7
Farms	16.9	19.3	18.3	19.3	18.1	18.8	19.5	20.3	21.4	20.9	20.6	20.9	20.8	21.9
Mining	8.5	8.9	7.9	8.8	9.7	9.9	9.9	9.6	10.5	11.3	11.2	10.2	10.0	10.8
Contract construction	12.2	13.4	13.7	14.9	17.0	17.1	17.2	17.3	18.6	19.5	19.2	18.4	19.0	18.8
Manufacturing	38.1	36.0	31.0	42.6	102.0	106.0	111.9	103.3	116.7	116.4	117.8	110.6	123.1	125.5
Durable goods industries	44.6	45.3	42.6	51.3	58.9	60.6	66.1	59.6	67.9	66.5	66.7	58.3	na	na
Nondurable goods industries	38.3	39.7	39.5	41.3	43.1	44.5	45.9	44.2	48.7	49.9	51.1	52.2	na	na
Wholesale and retail trade	53.7	54.5	54.7	61.3	61.4	63.2	65.7	65.0	70.8	72.5	72.5	71.3	76.9	78.0
Finance, insurance, and real estate	30.7	32.3	34.5	36.7	38.8	39.5	40.1	41.3	43.9	45.7	48.4	50.0	52.5	54.7
Finance and insurance	7.9	8.5	8.9	9.6	10.3	10.6	10.9	11.8	12.9	13.7	14.0	14.4	15.3	16.0
Transportation	17.3	17.1	15.5	18.0	20.2	18.1	19.0	18.6	20.3	21.9	20.7	18.3	21.1	21.4
Railroads	9.7	9.4	7.4	8.7	9.6	9.0	8.8	8.1	9.3	9.7	9.1	8.3	8.6	8.6
Communications	4.2	4.7	4.8	5.0	5.4	5.8	6.0	6.5	7.3	7.9	8.4	8.6	9.2	9.8
Public utilities	4.2	4.7	5.0	5.3	5.8	7.1	7.7	8.3	9.4	10.4	11.1	11.6	12.9	13.5
Services	28.5	29.4	29.5	31.0	31.3	32.0	33.3	33.9	35.8	38.2	39.6	40.5	42.5	44.9
Households and institutions	8.2	8.7	9.2	10.1	10.3	10.4	11.1	11.3	12.5	13.3	14.1	14.8	15.1	16.1
Government and government enterprises	26.1	20.5	27.9	28.8	34.3	37.2	37.0	35.6	30.6	37.2	37.9	38.1	38.7	39.7
General government	22.8	22.8	23.9	24.8	30.3	33.3	32.8	32.3	33.2	32.7	33.2	33.4	33.5	34.7
Rest of the world	1.1	1.2	1.3	1.4	1.3	1.3	1.4	1.6	1.8	2.0	2.2	2.2	2.3	2.3
Residual [1]	−5.1	−5.9	−3.3	−6.3	−5.5	−3.0	−.4	0	−1.3	−3.0	−1.7	−1.1	−2.5	−2.4

1. Represents GNP measured as sum of final products minus real GNP measured as sum of industry products. Does not include the statistical discrepancy, as shown in the hitherto published GNP accounts, since industry real product has been calculated using industry totals adjusted to include a proportional share of the discrepancy.

SOURCE: U.S. Department of Commerce, Office of Business Economics.

Table 5.—Indexes of Gross Product in Constant (1954) Dollars, by Industry

[Index numbers, 1954=100]

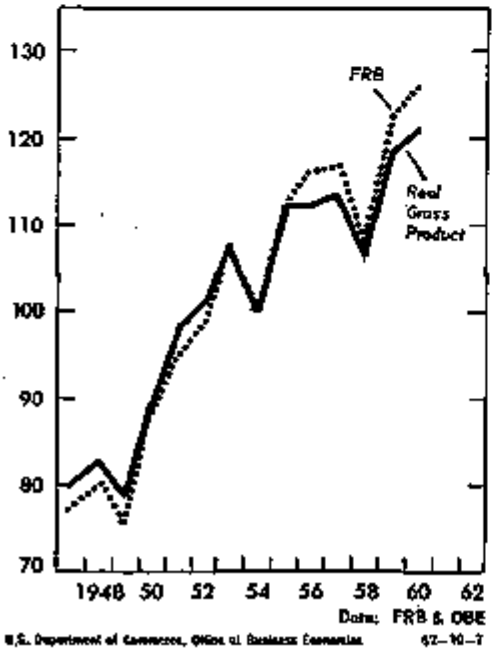
	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
All industries, total (GNP)	77.7	80.7	80.6	87.5	94.1	97.4	101.5	100.0	106.2	110.4	112.6	110.6	118.0	121.2
Agriculture, forestry, and fisheries	83.1	94.4	90.1	94.8	98.7	92.5	95.8	100.0	104.7	102.8	100.9	102.3	101.9	105.6
Farms	83.8	96.1	90.1	95.1	99.2	92.5	96.1	100.0	105.4	103.0	101.5	103.0	102.5	107.4
Mining	88.5	92.7	82.3	91.7	101.0	100.0	103.1	100.0	110.4	116.7	118.7	108.3	110.4	112.5
Contract construction	70.5	77.5	79.2	86.1	98.3	98.3	99.4	100.0	107.5	112.7	111.0	108.4	113.3	108.7
Manufacturing	80.1	82.9	78.9	89.2	95.3	101.2	107.8	100.0	112.4	112.1	113.6	106.5	118.6	120.9
Durable goods industries	75.2	77.7	71.3	88.1	96.8	101.5	110.9	100.0	112.0	111.4	111.0	97.8	na	na
Nondurable goods industries	86.6	89.8	89.4	93.4	97.5	100.7	103.8	100.0	116.2	112.7	115.6	118.1	na	na
Wholesale and retail trade	82.5	83.3	84.2	94.2	94.5	97.2	101.1	100.0	108.9	111.5	111.5	109.7	118.3	120.0
Finance, insurance, and real estate	74.3	78.2	82.5	88.2	93.9	95.6	97.1	100.0	106.3	110.7	117.2	121.1	127.1	132.4
Finance and insurance	66.9	72.0	75.4	81.4	87.8	89.8	92.4	100.0	109.3	115.1	118.5	122.0	129.7	135.5
Transportation	96.1	95.0	86.1	100.0	113.2	108.1	105.6	100.0	112.8	116.7	116.0	107.2	117.2	118.0
Railroads	119.8	116.0	91.4	107.4	118.5	111.1	108.6	100.0	114.8	119.8	112.3	102.6	106.2	106.2
Communications	64.6	72.3	72.8	76.8	83.1	89.3	93.3	100.0	112.3	121.6	129.2	132.3	141.6	150.8
Public utilities	51.6	56.6	60.2	69.2	79.5	85.5	92.8	100.0	113.3	125.2	133.7	139.8	155.4	166.2
Services	84.1	86.7	87.0	91.4	92.3	94.4	98.2	100.0	105.6	112.7	118.5	119.5	125.4	132.4
Households and institutions	73.6	77.8	81.4	89.4	91.2	92.0	96.2	100.0	110.6	119.5	124.8	129.3	133.6	142.5
Government and government enterprises	71.3	72.7	75.2	78.7	96.1	101.6	101.1	100.0	100.0	101.6	105.8	104.1	105.7	103.5
General government	70.0	70.6	74.0	76.8	96.4	102.5	101.5	100.0	99.7	101.2	102.8	103.4	104.6	107.4
Rest of the world	68.8	75.0	81.3	87.5	81.3	81.3	87.5	100.0	112.6	128.0	137.6	137.5	143.8	143.8

Source: U.S. Department of Commerce, Office of Business Economics.

relatively fixed costs are spread over larger volumes of output, and unit costs can be reduced as a result of improved efficiency. Profit margins rise, and aggregate profits increase sharply as sales volumes expand.

MANUFACTURING OUTPUT:

Real Gross National Product and FRB Indexes, 1947-60



Diversity of cost-price structure

Focusing on the individual industries for the 1947–60 period, capital consumption charges per unit of output generally increased more rapidly than gross product prices. The extreme example is mining, where 22 points of the 28 point increase in the price index were associated with capital consumption. (See table 7.)

With respect to the relative role of employee compensation and profit-type incomes in cost-price developments, there appears to have been a tendency for profit margins to be maintained relatively better in the more rapidly growing industries. As previously noted, the industries with the most rapid growth in real output included finance and insurance, communications, and public utilities. In finance and insurance and communications, where prices rose over the postwar period, the percent increase in unit labor costs was less than that in profit margins. In public utilities the implicit deflator declined over the postwar period, but with rapid technological advance the unit cost of employee compensation dropped so sharply that profits per unit of output increased slightly.

In manufacturing, whose growth rate during the postwar period was about average, unit payroll costs increased more rapidly than the industry price deflator. The rise in unit profits was substantially less.

In trade and transportation the price rise was associated predominantly with compensation of employees; these unit costs increased far more than the industry price index. Correspondingly, profit margins were reduced. Aggregate profits—corporate plus noncorporate—in these industry groups changed little over the postwar years as a whole.

Appendix
Concepts and Methods

THE national output total can be obtained via several routes, following the explanation in the 1954 NATIONAL INCOME, a supplement to the SURVEY OF CURRENT BUSINESS. Up to the present, two methods have served as the foundation for arriving at the gross national product. Briefly, one provides for compiling the value of the final purchases made by (or, conversely, final sales made to) persons, government, business investors, and foreign trade, plus the change in business inventories. Under the other method, the returns to the factors of production (wages, profits, rent, etc.) are added to the non-factor charges (indirect business taxes, depreciation, etc.) to arrive at the same output total.

A third approach, which is used in this study, emphasizes the industrial origin of the gross product. It rests on the fact that the gross national product is equal to the sum of each industry's gross product.

Product originating in an industry is the contribution of that industry's ac-

Table 6.—Gross Product in Current Dollars, by Industry

[Billions of dollars]

	Total (GNP)	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit-type income
All industries, total (GNP)						
1947	234.3	158.8	3.8	13.0	19.3	65.9
1948	259.4	141.0	4.2	15.6	21.1	78.5
1949	258.1	140.8	4.8	17.2	22.4	72.2
1950	284.6	154.2	5.5	19.1	24.6	82.0
1951	329.0	180.3	6.3	22.0	26.6	93.5
1952	347.0	195.0	7.1	24.0	29.3	90.2
1953	365.4	206.9	8.3	25.5	31.6	93.0
1954	362.1	207.6	9.1	28.8	31.4	85.2
1955	397.5	223.9	10.4	32.0	34.3	93.9
1956	419.2	242.5	11.7	34.4	37.3	93.7
1957	442.8	256.5	13.4	37.4	40.0	97.5
1958	444.5	257.1	14.8	38.6	41.1	94.3
1959	482.7	278.6	16.4	41.0	44.7	106.1
1960	503.4	293.7	18.1	43.3	46.8	102.2
Agriculture, forestry, and fisheries						
1947	21.2	3.1	0.3	1.6	0.7	15.6
1948	24.4	3.4	.4	2.0	.7	18.0
1949	19.9	3.2	.4	2.4	.8	13.1
1950	21.2	3.0	.5	2.7	.8	14.2
1951	24.3	3.2	.5	3.2	.9	16.5
1952	23.6	3.2	.6	3.3	1.0	15.5
1953	21.6	3.2	.6	3.4	1.0	13.5
1954	21.3	3.2	.6	3.5	1.0	12.9
1955	20.6	3.2	.7	3.6	1.1	12.0
1956	20.4	3.3	.7	3.6	1.1	11.8
1957	20.4	3.4	.6	3.8	1.2	11.3
1958	22.5	3.5	.9	3.9	1.3	13.0
1959	21.2	3.6	1.0	4.2	1.3	11.1
1960	22.2	3.7	1.1	4.2	1.4	11.9
Farms						
1947	20.7	2.8	0.3	1.6	0.6	15.4
1948	23.6	3.6	.4	2.0	.7	17.7
1949	18.3	2.9	.4	2.4	.9	12.9
1950	20.5	2.7	.5	2.7	.8	13.0
1951	23.6	2.8	.5	3.1	.9	16.2
1952	22.6	2.8	.6	3.3	.9	15.7
1953	20.9	2.8	.6	3.4	.9	12.1
1954	20.3	2.7	.6	3.5	1.0	12.5
1955	19.6	2.7	.7	3.6	1.0	11.6
1956	19.3	2.7	.7	3.6	1.1	11.2
1957	19.4	2.6	.8	3.7	1.1	10.9
1958	21.8	2.9	.9	3.9	1.2	12.8
1959	20.0	3.0	1.0	4.0	1.2	10.8
1960	20.9	3.0	1.1	4.0	1.3	11.4
Mining						
1947	6.9	3.1	(*)	1.2	0.3	1.6
1948	8.1	3.5	(*)	1.6	.4	2.5
1949	7.0	3.1	(*)	1.7	.4	1.7
1950	8.2	3.4	(*)	2.0	.5	2.2
1951	9.3	3.9	(*)	2.3	.6	2.6
1952	9.1	4.0	(*)	2.6	.6	1.9
1953	9.5	4.1	(*)	2.8	.7	1.9
1954	9.8	3.7	(*)	3.1	.8	1.8
1955	11.0	4.1	(*)	3.5	1.0	2.4
1956	11.8	4.5	(*)	3.7	1.0	2.6
1957	11.6	4.7	(*)	3.7	1.0	2.4
1958	10.5	4.2	(*)	3.6	1.0	1.8
1959	10.6	4.2	0.1	3.6	1.1	1.7
1960	11.0	4.3	.1	3.9	1.2	1.6
Contract construction						
1947	9.9	6.1	(*)	0.3	0.2	3.3
1948	11.1	7.4	(*)	.4	.1	3.1
1949	11.2	7.3	(*)	.5	.2	3.2
1950	12.6	8.2	(*)	.6	.3	3.5
1951	16.2	10.4	(*)	.7	.3	3.8
1952	16.5	11.3	(*)	.7	.3	4.1
1953	17.1	11.8	(*)	.8	.4	4.1
1954	17.3	12.0	(*)	.8	.4	4.0
1955	18.8	12.9	(*)	1.0	.5	4.4
1956	21.0	14.4	(*)	1.1	.5	5.0
1957	21.0	14.9	0.1	1.2	.6	5.3
1958	21.6	14.9	.1	1.2	.6	4.9
1959	23.4	16.2	.1	1.3	.7	5.3
1960	23.8	16.7	(*)	1.4	.8	5.1
Manufacturing						
1947	60.8	44.5	(*)	2.6	6.1	12.1
1948	73.1	48.6	(*)	3.0	6.5	15.3
1949	70.8	45.1	(*)	3.3	6.6	14.8
1950	82.9	52.6	−0.1	3.7	7.2	18.9
1951	97.4	62.4	−.1	4.3	7.6	22.7
1952	101.5	67.4	(*)	4.9	8.7	20.0
1953	110.5	74.8	(*)	5.3	9.5	19.9
1954	103.8	71.1	.1	5.4	8.8	17.2
1955	118.7	78.0	(*)	7.5	8.9	23.0
1956	123.3	84.1	(*)	8.0	10.5	23.5
1957	129.1	87.9	.2	8.8	11.2	21.2
1958	120.8	83.7	.2	9.2	10.9	17.2
1959	137.1	92.9	.2	9.6	12.6	23.5
1960	140.9	96.3	.2	10.1	13.2	22.2
Durable goods industries						
1947	32.7	25.1	(*)	1.3	1.3	5.3
1948	37.6	27.5	(*)	1.6	1.6	7.2
1949	36.6	25.4	(*)	1.7	1.7	7.8
1950	45.1	29.9	0.1	1.8	1.9	11.7
1951	53.3	37.4	.1	2.2	2.4	13.1
1952	58.2	41.3	(*)	2.6	2.5	11.0
1953	65.0	49.6	(*)	3.2	3.0	11.8
1954	59.5	43.2	(*)	3.6	2.7	10.0
1955	69.3	48.2	.1	4.0	3.4	13.6
1956	71.8	52.4	(*)	4.3	3.4	12.2
1957	70.9	54.9	.1	4.8	3.7	12.6
1958	67.8	50.9	.2	4.9	3.5	8.9
1959	na	na	na	na	na	na
1960	na	na	na	na	na	na
Nondurable goods industries						
1947	32.9	19.4	(*)	1.3	1.3	6.7
1948	36.5	21.1	(*)	1.5	1.9	8.1
1949	34.2	20.8	(*)	1.7	1.9	6.8
1950	36.6	22.6	(*)	1.8	2.0	7.2
1951	42.1	25.0	(*)	2.1	2.2	9.6
1952	43.3	26.1	(*)	2.3	2.4	8.4
1953	45.4	28.0	(*)	2.6	2.5	7.9
1954	44.2	27.9	0.1	2.9	2.6	7.3
1955	49.4	29.8	(*)	3.5	2.6	9.4
1956	51.6	31.7	.1	3.7	2.7	9.8
1957	53.2	33.0	.1	4.1	2.8	9.6
1958	53.0	32.8	.2	4.3	2.8	9.4
1959	na	na	na	na	na	na
1960	na	na	na	na	na	na
Wholesale and retail trade						
1947	45.5	23.6	(*)	1.6	5.3	15.2
1948	50.9	25.1	(*)	1.9	5.9	17.2
1949	50.6	25.4	(*)	2.2	6.2	15.4
1950	54.0	28.3	(*)	2.3	7.0	16.4
1951	60.9	31.2	0.1	2.8	7.0	18.1
1952	63.4	33.0	.1	3.1	8.3	17.7
1953	64.4	35.1	(*)	3.3	8.9	16.7
1954	65.0	36.2	.1	3.4	9.0	16.2
1955	70.9	38.8	.1	3.6	9.8	18.6
1956	75.1	41.9	.1	4.1	10.9	18.6
1957	78.6	44.2	.2	4.6	11.8	18.0
1958	79.1	45.0	.2	4.8	12.2	17.6
1959	86.2	48.6	.2	4.9	13.4	20.9
1960	89.1	51.6	.1	5.0	14.7	18.2
Finance, insurance, and real estate						
1947	22.1	4.7	1.7	2.8	3.7	8.8
1948	24.7	5.3	1.6	3.1	4.1	10.7
1949	27.9	5.6	1.3	3.4	4.5	12.6
1950	30.3	6.2	2.0	3.7	4.9	13.6
1951	33.2	6.8	2.4	4.1	5.3	14.6
1952	36.0	7.3	2.6	4.3	5.8	15.6
1953	38.9	8.0	3.0	4.8	6.2	16.5
1954	41.3	8.7	3.6	5.2	6.7	17.1
1955	44.0	9.5	4.1	5.7	7.2	17.3
1956	46.2	10.4	4.6	6.2	8.0	17.4
1957	50.6	11.1	5.3	6.8	8.6	18.8
1958	53.7	11.9	6.0	7.3	9.1	19.6
1959	57.9	13.0	7.0	7.9	9.0	20.4
1960	61.3	13.9	7.8	8.5	10.3	21.0
Finance and insurance						
1947	5.6	3.8	−0.3	0.1	0.4	1.5
1948	6.8	4.2	−.7	.2	.4	2.2
1949	7.6	4.5	−.7	.2	.5	3.0
1950	7.8	5.0	−.9	.2	.5	2.9
1951	8.9	5.5	−.9	.3	.5	3.4
1952	8.9	6.1	−1.1	.3	.7	3.8
1953	11.1	6.7	−1.1	.3	.7	4.4
1954	11.8	7.5	−1.3	.4	.8	4.5
1955	12.2	7.9	−1.4	.4	.8	4.4
1956	12.9	8.7	−1.7	.4	.9	4.7
1957	14.1	9.4	−1.9	.5	1.0	5.2
1958	15.3	10.1	−2.0	.6	1.0	5.6
1959	17.0	11.1	−2.2	.6	1.1	6.5
1960	18.1	11.9	−2.5	.7	1.2	7.1
Transportation						
1947	13.3	9.7	0.3	1.0	1.1	1.5
1948	14.9	10.3	.3	1.1	1.2	2.1
1949	14.4	9.9	.3	1.2	1.3	1.7
1950	15.8	10.4	.3	1.3	1.3	2.6
1951	18.0	12.0	.3	1.5	1.5	2.6
1952	18.7	12.5	.3	1.7	1.5	2.5
1953	19.4	13.1	.3	1.9	1.7	2.3
1954	18.0	12.5	.3	2.0	1.6	1.5
1955	19.8	13.2	.4	2.3	1.8	2.0
1956	20.8	14.3	.3	2.4	1.9	2.1
1957	21.8	15.0	.4	2.7	2.1	1.7
1958	20.9	14.4	.4	2.7	2.0	1.4
1959	21.9	15.4	.4	2.8	1.8	1.7
1960	22.4	15.9	.5	2.9	1.9	1.4
Railroads						
1947	7.4	5.4	0.3	0.4	0.6	0.9
1948	8.1	5.8	.3	.4	.6	1.0
1949	7.4	5.4	.3	.4	.6	.7
1950	8.1	5.6	.3	.4	.6	1.2
1951	9.1	6.4	.3	.6	.7	1.2
1952	9.4	6.5	.3	.7	.7	1.2
1953	9.4	6.5	.3	.8	.8	1.0
1954	8.1	5.9	.3	.9	.7	.4
1955	8.9	6.1	.3	1.0	.7	.7
1956	9.2	6.6	.3	1.0	.8	.8
1957	9.3	6.6	.3	1.0	.9	.6
1958	8.5	6.1	.3	1.0	.8	.4
1959	8.5	6.2	.3	.9	.7	.4
1960	8.4	6.1	.3	.9	.7	.3
Communications						
1947	3.3	2.6	0.1	0.3	0.6	0.3
1948	3.7	2.3	.1	.4	.7	.3
1949	4.0	2.4	.1	.4	.7	.4
1950	4.6	2.5	.1	.4	.8	.7
1951	5.1	2.8	.1	.5	.9	.9
1952	6.7	3.1	.1	.5	1.0	1.0
1953	6.2	3.4	.1	.6	1.1	1.2
1954	6.5	3.5	.1	.6	1.1	1.2
1955	7.0	3.8	.1	.7	1.3	1.6
1956	7.6	4.2	.2	.7	.9	1.6
1957	8.3	4.4	.2	.8	1.0	1.8
1958	8.8	4.4	.2	.9	1.1	2.2
1959	9.7	4.8	.3	1.0	1.2	2.6
1960	10.3	4.9	.3	1.1	1.3	2.8
Public utilities						
1947	4.0	1.6	0.2	0.6	0.6	1.0
1948	4.4	1.8	.3	.6	.7	1.1
1949	5.1	2.0	.3	.7	.7	1.4
1950	5.5	2.1	.3	.8	.8	1.5
1951	6.4	2.3	.4	.9	.9	1.9
1952	6.9	2.4	.4	1.0	.9	2.1
1953	7.6	2.5	.5	1.1	.9	2.3
1954	8.3	2.9	.6	1.4	1.0	2.4
1955	9.0	3.1	.6	1.7	1.1	2.0
1956	9.7	3.3	.7	1.9	1.2	2.7
1957	10.5	3.5	.8	2.1	1.3	2.7
1958	11.1	3.8	.9	2.3	1.4	2.7
1959	12.2	4.0	1.0	2.5	1.5	3.2
1960	13.0	4.2	1.1	2.7	1.7	3.5
Services						
1947	21.3	11.7	1.0	1.1	0.9	6.3
1948	22.9	12.6	1.4	1.3	.9	6.9
1949	23.9	13.0	1.7	1.5	.9	6.9
1950	25.8	13.9	2.1	1.5	1.0	7.4
1951	28.2	15.1	2.4	1.7	1.0	7.8
1952	30.3	16.2	2.7	1.9	1.1	8.2
1953	32.7	17.3	3.4	2.0	1.2	8.8
1954	33.9	18.0	3.0	2.3	1.1	8.8
1955	37.5	19.6	4.2	2.6	1.1	10.2
1956	41.1	21.7	4.8	2.8	1.3	11.0
1957	44.4	23.4	5.3	2.9	1.3	11.5
1958	46.0	24.8	5.6	3.1	1.4	11.6
1959	50.9	27.0	6.0	3.3	1.6	13.2
1960	54.3	29.5	6.7	3.5	1.7	13.3
Households and institutions						
1947	8.1	6.1	1.0			
1948	8.9	6.9	1.9			
1949	7.4	6.8	1.6			
1950	8.4	6.3	2.1			
1951	9.1	6.8	2.3			
1952	9.8	7.1	2.7			
1953	10.9	7.6	2.8			
1954	11.3	7.7	2.6			
1955	12.7	8.6	4.1			
1956	14.1	9.3	4.8			
1957	15.3	10.1	5.2			
1958	15.9	10.9	5.4			
1959	17.5	11.7	5.8			
1960	19.4	12.6	6.6			
Government and government enterprises						
1947	19.3	18.6				0.6
1948	20.1	19.7				.5
1949	22.3	21.9				.4
1950	23.6	23.5				.2
1951	30.4	30.2				.1
1952	35.0	34.5				.5
1953	38.1	37.5				.6
1954	38.6	38.9				.7
1955	38.2	37.8				.4
1956	40.2	40.4				−.2
1957	43.3	43.2				.2
1958	46.7	46.6				.1
1959	49.4	49.0				.5
1960	53.9	53.5				.4

Table 6.—Gross Product in Current Dollars, by Industry—Continued

(Billions of dollars)

	General government						Rest of the world					
	Total	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit-type income	Total	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit-type income
1947	16.7	16.7					0.8	(*)	0.1			0.7
1948	17.4	17.4					1.0	(*)	.1			.8
1949	19.4	19.4					1.0	(*)	.2			.8
1950	20.8	20.8					1.2	(*)	.2			1.0
1951	27.2	27.2					1.4	(*)	.2			1.2
1952	31.0	31.0					1.3	(*)	.2			1.1
1953	31.8	31.8					1.3	(*)	.2			1.1
1954	32.3	32.3					1.6	(*)	.2			1.4
1955	34.0	34.0					1.8	(*)	.2			1.6
1956	36.4	36.4					2.0	(*)	.2			1.8
1957	38.9	38.9					2.2	(*)	.3			1.9
1958	42.0	42.0					2.1	(*)	.3			1.8
1959	44.1	44.1					2.2	(*)	.4			1.8
1960	47.3	47.3					2.3	(*)	.4			1.9

NOTE.—Total GNP includes the statistical discrepancy. Proportional amounts of the discrepancy are also included in the total gross product of each industry. The statistical discrepancy is not distributed among the gross product components and consequently the components will not add to the total. The statistical discrepancy included in total GNP is as follows, in billions of dollars: 1947, $3.5; 1948, —$0.8; 1949, $0.5; 1950, —$0.7; 1951, $1.2; 1952, $1.4; 1953, $1.3; 1954, $0.9; 1955, $1.0; 1956, —$2.4; 1957, —$0.6; 1958, —$1.5; 1959, —$3.0; 1960, —$3.4.

Employee compensation consists of wages, salaries, and supplements.

Net interest is net interest component of national income.

Capital consumption allowances consist of depreciation, capital outlays charged to current expense, and accidental damage to fixed business property.

Indirect business taxes consist of indirect business tax and nontax liability and business transfer payments.

Profit-type income consists of corporate profits after inventory valuation adjustment, proprietors' income, rental income of persons, and surplus of government enterprises, less subsidies.

Capital consumption allowances and profits by industry differ somewhat from the hitherto published figures because these two items have been reallocated by industry from a company to an establishment basis.

*Less than $50 million.

Source: U.S. Department of Commerce, Office of Business Economics.

tivity to the Nation's total output of goods and services, as encompassed within the framework of the national income and product accounts.

Industry gross product

Industry gross product can be measured as the amount by which an industry's total product exceeds the value of the materials and services it buys on current account. As in the case of GNP for the economy as a whole, industry gross product can also be calculated as the sum of the factor returns and non-factor costs of production.

Gross product at factor cost and at market price

Under the definitions used for the U.S. national accounts and for this study, gross product originating in an industry is measured at its market value rather than at "factor" cost. That is, indirect business taxes (excise tax, property tax, sale tax, etc.) are included in the value of industry product and direct government subsidies are subtracted. On a "factor" cost basis, these taxes would not have been added and subsidies would not have been subtracted. Since the market price basis is used, the estimates of industry gross product are consistent with the regularly published GNP totals. Consequently, the analysis of the total in terms of its industrial source is facilitated. In addition, the market price basis is preferred since most of the data available are of this type.[3]

The effect of including indirect business taxes and subsidies increases the weight for the industries paying the tax and reduces it for those receiving subsidy. The amounts involved are, in general, small enough so that the differences in weights have little effect on aggregated indexes.

Gross product in constant dollars

Isolation of price movements in an industry's gross product brings into view the underlying shifts in real gross product. For many analytical purposes, gross product in real terms is the central issue and it is essential to transform the current-dollar totals accordingly.

The gross product of an industry measured from the income side is not directly convertible to constant dollars because its components, employee compensation, interest, profits, depreciation, etc. are not factorable into quantity and unit price suitable for this purpose. Gross product can be adjusted indirectly for price changes, however, by deflating output and purchases, separately. Both the output and the purchases consist of specifiable goods and services which can be analyzed into quantity and price. The difference between the two deflated figures is gross product in constant dollars. This method is known as the "double deflation" method. With modifications, it provided the basis for deriving the real product measures used in this study for farms, construction, manufacturing, the major portions of finance and insurance, electric utilities, and railroads.

The array of data required for double deflation was not available for the other industrial activities. In these cases the method was approximated by extrapolating the base year gross product by an index of the quantity of total output—i.e., sales plus inventory change before deduction of purchases of raw materials and other intermediate products.

With the availability of industry gross product in current and constant prices, it is possible to calculate implicit deflators for each industry. This is done by dividing the constant-dollar total into the current-dollar total. These implicit deflators can generally be used like a price index of the output produced by the economic resources engaged in an industry. In using them certain of their technical characteristics ought to be kept in mind. In the first place, they are unlike ordinary price indexes in that they are subject to change not only in response to price movements, but also in response to changes in the mix among products with different prices. This characteristic is also true of the GNP prices by final purchasers. In addition, the units to which these implicit deflators refer are more elusive than those underlying the ordinary price indexes referring to goods and services. These implicit deflator indexes measure the percent that the gross product—sales minus purchases—of an industry in a given period is compared to the gross product which the same composite of

3. In converting gross product at factor cost to constant dollars, it is essential to know not only the taxes paid by the given industry, but also those which are incorporated in its intermediate purchases. Such data are not available.

Table 7.—Implicit Price Deflators of Gross Product and Component Costs and Profit per Unit of Gross Product in Constant (1954) Dollars, by Industry

[Index numbers, 1954=100]

	GNP implicit price deflator	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit-type income
All industries total (GNP)						
1947	82.0	45.6	1.3	4.6	6.8	23.8
1948	86.5	48.1	1.4	5.3	7.2	26.6
1949	89.2	48.1	1.6	5.9	7.7	24.7
1950	90.5	48.5	1.7	5.0	7.7	25.8
1951	96.2	52.5	1.8	6.4	7.8	27.1
1952	98.1	55.2	2.0	6.8	8.2	25.5
1953	99.0	56.6	2.9	7.2	8.6	24.1
1954	100.0	57.2	2.6	7.9	9.6	23.5
1955	101.2	57.0	2.6	9.1	9.7	24.4
1956	104.6	60.5	2.9	9.6	9.8	23.9
1957	108.4	62.5	3.3	9.2	9.8	23.7
1958	110.9	64.1	3.7	9.6	10.2	23.5
1959	112.6	65.0	3.8	9.6	10.4	24.6
1960	114.4	66.7	4.1	9.8	11.0	23.4
Agriculture, forestry, and fisheries						
1947	120.3	17.5	1.7	9.0	4.0	88.1
1948	121.4	16.9	2.0	10.0	3.5	88.6
1949	103.6	16.7	2.1	12.5	4.2	68.2
1950	105.0	14.9	2.5	13.4	4.0	70.3
1951	123.6	16.9	2.6	16.9	4.8	97.3
1952	119.6	16.2	3.0	16.8	5.1	78.7
1953	104.9	15.7	2.9	16.7	4.9	66.2
1954	100.0	15.0	2.8	16.4	4.7	60.9
1955	92.4	14.3	3.1	16.1	4.9	53.8
1956	93.2	13.1	3.2	16.4	5.0	53.0
1957	94.9	13.8	3.7	17.7	5.6	52.6
1958	102.2	15.1	4.1	17.9	6.0	59.6
1959	97.7	13.6	4.6	19.4	5.9	51.2
1960	97.8	13.5	4.9	18.5	6.2	52.4
Farms						
1947	122.5	16.6	1.8	9.5	3.8	91.1
1948	123.8	15.8	2.1	10.4	3.8	91.7
1949	105.6	15.8	2.2	12.1	4.4	70.5
1950	106.2	14.0	2.6	14.0	4.1	72.0
1951	130.4	15.5	2.8	17.1	5.0	90.5
1952	121.3	14.0	3.2	17.6	4.8	80.0
1953	107.2	14.4	3.1	17.4	4.6	67.2
1954	100.0	13.3	3.0	17.2	4.9	61.6
1955	91.6	12.6	3.3	16.8	4.7	54.2
1956	92.8	12.9	3.3	17.2	5.3	53.0
1957	94.2	13.6	3.9	18.0	5.3	52.9
1958	101.9	13.9	4.3	18.2	5.7	60.3
1959	96.2	14.4	4.8	19.2	5.8	51.9
1960	95.9	13.8	5.0	18.3	6.0	52.3
Mining						
1947	78.1	36.5	(*)	14.1	3.5	18.8
1948	91.0	39.3		15.0	4.5	28.1
1949	88.6	39.2		21.5	6.1	21.5
1950	93.2	38.6		22.7	5.7	28.1
1951	98.9	40.2		23.7	5.2	25.8
1952	94.8	41.7		26.0	6.3	19.8
1953	96.0	41.4		28.3	7.1	19.2
1954	100.0	38.5		33.3	8.3	18.8
1955	103.9	38.7		33.0	9.4	22.6
1956	105.4	40.2		33.0	8.9	22.2
1957	103.6	42.0		33.0	8.9	21.4
1958	102.9	41.2		34.5	9.8	17.5
1959	100.0	39.6	.9	34.0	10.4	16.0
1960	101.9	39.8	.9	36.1	11.1	14.8
Contract construction						
1947	72.8	50.0	(*)	2.5	1.8	18.9
1948	82.8	55.2		2.0	.7	23.1
1949	81.6	53.3		3.6	1.5	23.4
1950	84.8	55.7		4.0	2.0	23.5
1951	98.4	61.2		4.1	1.8	22.4
1952	96.5	66.1		4.1	1.8	24.0
1953	98.4	68.6		3.7	2.3	23.8
1954	100.0	69.4		4.6	2.3	23.1
1955	101.6	69.4		5.4	2.7	23.7
1956	107.7	73.8		5.6	2.6	25.6
1957	114.1	77.6	.6	6.2	3.1	27.6
1958	117.4	81.0	.3	6.5	3.3	26.6
1959	119.4	82.7	.5	6.6	3.6	27.0
1960	126.6	88.3	(*)	7.4	4.3	27.1
Manufacturing						
1947	80.1	53.5	(*)	2.1	7.3	14.6
1948	85.0	55.5	(*)	2.5	7.6	17.8
1949	83.4	56.8	(*)	4.0	8.1	17.8
1950	82.4	56.7	−.1	4.0	7.8	20.4
1951	93.5	61.2	−.1	4.2	7.5	22.2
1952	96.7	64.2	(*)	4.7	8.8	19.0
1953	99.7	66.5	(*)	5.2	8.5	17.8
1954	100.0	66.5	.1	6.2	8.5	19.6
1955	101.7	65.8	(*)	6.4	8.8	19.7
1956	105.9	72.3	(*)	6.9	9.0	18.5
1957	109.6	74.6	.2	7.6	9.5	18.0
1958	109.3	75.7	.3	8.3	9.9	15.6
1959	111.4	75.5	.2	7.8	9.7	19.1
1960	112.3	76.7	.2	8.0	10.5	17.7
Durable goods industries						
1947	78.2	56.0	(*)	2.9	2.9	11.8
1948	81.2	59.4		3.5	3.5	15.6
1949	85.9	59.8		4.0	4.0	18.4
1950	87.9	58.3	.2	3.5	3.7	22.8
1951	93.9	63.6	.2	3.7	4.0	22.2
1952	96.2	68.3		4.3	4.1	19.2
1953	98.3	70.8		4.8	4.6	17.9
1954	100.0	72.5		6.0	4.5	16.3
1955	102.1	71.0	−.1	5.9	5.0	20.0
1956	106.0	76.8	(*)	6.5	5.1	18.3
1957	110.8	82.3	.1	7.2	5.5	18.9
1958	110.3	87.3	.3	8.4	5.7	15.3
1959	na	na	na	na	na	na
1960	na	na	na	na	na	na
Nondurable goods industries						
1947	85.9	50.7	(*)	3.4	12.5	17.5
1948	89.4	52.1		3.8	12.3	21.4
1949	86.6	52.7		4.3	12.4	17.2
1950	89.1	54.7		4.4	12.5	17.4
1951	97.7	58.0		4.9	12.1	22.8
1952	97.3	58.7		5.2	14.4	18.9
1953	98.9	61.0		5.7	14.2	17.2
1954	100.0	58.1	.2	6.9	13.8	16.3
1955	101.4	58.2	(*)	7.2	13.8	19.3
1956	103.4	58.7	.2	7.4	14.3	18.7
1957	104.1	59.6	.2	8.0	14.7	16.3
1958	101.3	62.8	.4	8.2	14.6	16.1
1959	na	na	na	na	na	na
1960	na	na	na	na	na	na
Wholesale and retail trade						
1947	86.6	43.9	(*)	3.0	9.9	28.3
1948	93.4	47.9	(*)	3.5	10.3	31.6
1949	92.3	48.3	(*)	4.2	11.3	28.2
1950	88.1	46.2	(*)	4.1	11.4	26.8
1951	98.0	50.8	.2	4.6	12.4	29.5
1952	98.7	52.2	.2	4.9	13.1	28.0
1953	98.0	53.4	(*)	5.0	13.5	25.4
1954	100.0	55.5	.2	5.2	13.8	24.9
1955	100.1	54.6	.1	5.1	13.8	26.3
1956	103.0	57.5	.1	5.7	14.0	25.7
1957	105.4	61.0	.3	6.3	14.3	24.6
1958	110.9	63.1	.5	6.3	17.1	24.7
1959	113.2	63.2	.3	6.2	17.4	26.0
1960	114.2	64.4	.1	6.4	18.3	25.3
Finance, insurance and real estate						
1947	72.0	15.8	5.5	9.1	12.1	29.7
1948	76.6	16.4	5.0	9.6	12.7	33.1
1949	80.0	16.2	5.2	9.9	13.0	35.5
1950	82.6	16.9	5.4	10.1	13.4	37.1
1951	85.6	17.5	6.2	10.6	13.7	37.1
1952	90.9	18.5	6.5	10.9	14.7	39.5
1953	97.0	20.0	7.5	12.0	15.5	41.4
1954	100.0	21.1	8.5	12.6	16.2	41.4
1955	100.2	21.6	9.3	13.0	16.4	39.4
1956	101.1	22.8	9.8	13.6	17.5	38.1
1957	104.5	23.9	10.7	14.0	17.8	38.9
1958	107.4	25.3	12.0	14.6	18.3	39.2
1959	110.3	24.8	13.3	14.0	18.9	38.9
1960	112.1	25.4	13.9	15.5	19.7	38.4
Finance and insurance						
1947	70.9	48.1	−3.8	1.9	5.1	19.0
1948	74.1	48.4	−3.2	2.4	4.7	25.9
1949	83.4	50.0	−7.9	2.2	6.8	38.7
1950	81.2	52.1	−9.4	2.1	5.2	30.2
1951	80.4	53.4	−8.7	2.9	5.8	33.0
1952	93.4	57.5	−10.4	2.8	6.8	35.8
1953	101.3	64.6	−10.1	2.8	6.4	40.4
1954	100.0	64.8	−11.0	3.4	6.8	38.1
1955	96.3	61.2	−10.9	3.1	6.2	36.7
1956	94.2	63.5	−12.4	2.9	6.6	34.3
1957	100.7	67.1	−13.6	3.6	7.1	37.1
1958	106.3	70.1	−13.9	4.2	6.9	38.9
1959	111.1	72.5	−14.4	3.9	7.2	43.5
1960	113.1	74.4	−16.3	4.4	7.5	44.4
Transportation						
1947	79.3	55.1	1.7	5.3	6.4	8.7
1948	87.1	60.2	1.8	6.4	7.0	12.3
1949	82.9	61.9	1.9	7.7	8.4	11.0
1950	87.8	57.8	1.7	7.2	7.2	13.9
1951	89.1	59.4	1.5	7.1	7.4	12.9
1952	97.9	65.4	1.6	8.9	8.4	13.1
1953	103.1	68.9	1.6	10.0	8.9	12.1
1954	100.0	60.4	1.7	11.1	8.9	8.3
1955	97.5	66.0	2.0	11.3	8.9	9.9
1956	99.0	65.1	1.4	11.4	9.0	10.0
1957	105.3	72.5	1.9	12.0	10.1	8.2
1958	102.3	74.6	2.1	14.0	10.4	7.3
1959	103.8	73.0	1.9	13.2	8.5	8.1
1960	104.7	74.3	2.3	14.0	8.9	8.5
Railroads						
1947	76.3	55.7	3.1	4.1	6.2	8.2
1948	85.3	61.7	3.2	4.8	6.4	10.6
1949	100.0	73.0	4.1	5.5	8.1	9.3
1950	93.1	64.4	3.4	4.6	6.9	13.8
1951	94.8	68.7	3.1	6.3	7.3	11.5
1952	104.4	72.2	3.3	7.3	7.9	13.2
1953	103.8	73.8	3.4	9.1	9.1	11.4
1954	100.0	72.8	3.7	11.1	8.6	4.9
1955	95.7	65.8	3.2	10.8	7.5	7.5
1956	98.9	68.6	3.1	10.3	8.2	8.2
1957	102.2	72.5	3.3	11.0	9.9	6.6
1958	102.4	73.6	3.6	12.0	9.6	4.8
1959	98.8	72.1	3.1	10.5	8.1	4.7
1960	97.7	70.9	3.5	10.5	8.1	3.8
Communications						
1947	78.0	47.6	2.4	7.1	14.3	7.1
1948	78.7	48.9	2.1	8.5	14.9	8.4
1949	83.3	50.0	2.1	8.3	14.6	8.3
1950	90.0	50.0	2.0	8.0	16.0	14.0
1951	94.4	51.9	1.9	9.3	16.7	16.7
1952	98.2	52.4	1.7	8.6	17.2	17.2
1953	100.0	53.7	1.7	10.0	18.9	20.0
1954	100.0	53.5	1.5	9.2	18.9	18.5
1955	95.9	52.1	1.4	9.6	19.0	21.9
1956	98.2	53.2	2.5	8.9	19.4	20.8
1957	98.9	52.4	2.4	9.6	19.9	21.4
1958	102.9	51.2	2.3	30.5	12.8	25.8
1959	105.4	50.0	3.3	30.9	13.0	28.2
1960	105.1	50.0	3.1	31.2	13.3	28.6
Public utilities						
1947	95.2	38.1	7.1	14.3	14.3	23.8
1948	93.6	38.3	6.4	12.8	14.9	23.4
1949	102.0	40.0	6.0	14.0	14.0	28.0
1950	94.8	36.2	5.2	13.8	13.8	25.9
1951	97.0	34.3	6.1	13.6	13.6	28.3
1952	97.2	35.2	5.6	14.1	11.3	30.6
1953	96.7	36.4	6.6	14.3	11.7	30.9
1954	100.0	34.9	7.3	14.9	12.0	29.9
1955	96.7	34.0	6.4	16.1	11.7	27.7
1956	98.3	34.7	6.7	16.3	11.5	26.0
1957	94.6	34.5	7.3	15.9	11.7	24.3
1958	95.7	33.3	7.5	19.8	12.1	23.3
1959	93.5	31.0	7.5	19.4	12.4	24.8
1960	94.2	30.4	8.0	19.5	12.2	23.4
Services						
1947	74.7	41.1	4.5	8.9	8.2	22.1
1948	77.2	42.9	4.8	4.4	8.1	23.5
1949	81.0	44.1	5.3	5.1	8.1	23.4
1950	82.2	44.5	5.3	4.9	8.2	23.9
1951	90.1	48.2	7.7	5.4	8.2	24.9
1952	91.7	50.6	8.4	5.9	8.4	25.6
1953	93.2	52.0	10.2	6.0	8.6	26.4
1954	100.0	53.1	10.8	6.6	8.2	26.0
1955	104.7	54.7	11.7	6.4	8.2	28.5
1956	107.6	56.8	12.6	6.8	8.4	28.8
1957	112.4	59.2	13.4	7.2	8.3	29.1
1958	114.8	61.2	13.6	7.7	8.7	29.1
1959	119.8	63.5	14.1	7.8	8.9	31.3
1960	120.9	65.7	14.9	7.8	8.8	29.6
Households and institutions						
1947	74.4	62.2	12.2			
1948	79.3	64.4	14.9			
1949	80.4	63.0	17.4			
1950	89.2	62.4	20.6			
1951	88.3	66.0	22.3			
1952	94.3	68.8	28.0			
1953	93.3	68.5	29.7			
1954	100.0	68.1	31.9			
1955	101.6	68.5	32.8			
1956	104.4	68.9	35.6			
1957	108.6	71.8	38.9			
1958	112.4	75.2	37.2			
1959	115.9	77.5	38.4			
1960	123.6	79.5	41.0			
Government and government enterprises						
1947	73.9	71.3				2.3
1948	75.8	74.1				1.9
1949	79.9	78.5				1.4
1950	81.9	81.6				.7
1951	87.4	88.5				.2
1952	94.1	92.7				1.3
1953	97.0	95.4				2.2
1954	100.0	98.1				1.9
1955	104.4	103.3				1.1
1956	108.1	108.6				−.5
1957	114.2	114.0				.3
1958	122.5	122.3				.3
1959	127.9	126.6				1.3
1960	133.2	132.3				1.0

Table 7.—Implicit Price Deflators of Gross Product and Component Costs and Profit Per Unit of Gross Product in Constant (1954) Dollars, by Industry—Continued

[Index numbers, 1954=100]

	General government						Rest of the world					
	Implicit price deflator	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit-type income	Implicit price deflator	Employee compensation	Net interest	Capital consumption allowances	Indirect business taxes	Profit type income
1947	78.2	78.2					72.7	(*)	9.1			83.6
1948	78.3	78.3					83.3	(*)	9.3			86.7
1949	81.2	81.2					76.9	(*)	15.4			81.5
1950	82.9	82.9					86.7	(*)	14.2			71.4
1951	88.6	88.6					107.7	(*)	15.4			92.3
1952	93.4	93.4					100.0	(*)	15.4			84.6
1953	97.0	97.0					92.9	(*)	14.3			78.6
1954	100.0	100.0					100.0	(*)	12.5			87.5
1955	103.6	103.6					100.0	(*)	11.1			88.9
1956	111.3	111.3					100.0	(*)	10.0			90.0
1957	117.2	117.2					100.0	(*)	13.6			86.4
1958	125.7	125.7					93.5	(*)	18.6			81.5
1959	130.5	130.5					93.7	(*)	17.4			78.3
1960	136.3	136.3					100.0	(*)	17.4			82.6

NOTE.—Calculated by dividing the total gross product in current dollars and each gross product component (table 5) by the corresponding gross product in constant (1954) dollars (table 4), and due to rounding may differ from deflators hitherto published for farms, households and institutions, and general government. The sum of the component costs and profits per unit of real gross product equals the implicit price deflator except for the statistical discrepancy which is included in the total gross product but not in the components.

*Less than 0.05.

Source: U.S. Department of Commerce, Office of Business Economics.

sales and purchases would have yielded in the prices of the base period.

The following example will clarify the concept. In this example, the current-dollar gross product is $500 ($600 −$100). The gross product for the same composite of sales and purchases in the prices of the base period would have yielded $150 ($200−$50). The implicit deflator is accordingly $500 divided by $150, or 333.3 in index number form. It may be noted that the implicit price deflator increases more than sales prices in this instance. This is so because purchase prices, which enter the implicit deflator with negative weights, increase less than sales prices.

	Period		
	II		I
	Quantities	Prices	Prices
Sales	100	$6	$2
Purchases	50	2	1

Effect of base period weights

The base period, 1954 in this report, selected for the conversion of output in current dollars to "real" terms or constant dollars may have an impact on the trends in real gross product. The deflated multiproduct total output (or intermediate purchases) of an industry can be considered as an aggregate in which the annual physical quantity of each product is multiplied, or weighted, by the price per unit for that product prevailing in the base year.

A weighted index can vary somewhat depending on the period to which the weights refer. A production index with unit prices as weights will generally show a greater increase (or smaller decline) if the weights refer to an early year than to a recent year. This phenomenon occurs because as the production of a good rises rapidly, its price tends to lag behind the prices of other goods (declines more rapidly or rises more slowly). In such cases, the price of the expanding product is higher relative to other prices in the early period than it is in the later period. Thus, the early price gives more weight to the rising output than the later period price does.

Quality changes as reflected in industry gross product

One further aspect of real product needs to be mentioned, and that concerns the issue of quality changes. This problem is among those dominating the discussion of price and production measures. However, it will be noted here only briefly. There is a consensus that improvements in the quality of goods and services should be reflected in the measures of real output. There is also widespread agreement that the existing price and production indexes do not fully account for changes in quality. If it is agreed that quality improvements have occurred, then the real output measures presented here understate somewhat the "true" gain that would have been shown if more satisfactory price and quantity measures had been available. Not only may a general understatement prevail, but, if quality advanced at an uneven pace, the relative importance of individual industries may be affected.

Relationship of industry gross product to other GNP data

We have already noted that a major purpose of this study is to develop measures of the industrial origin of the existing series on gross national product. Consequently, the industry gross product data were constructed using concepts identical to those of the hitherto published national income and product series, with one important exception. In the GNP accounts, property income and capital consumption allowances are on a company basis. Labor and mixed and incomes are generally on an establishment basis. A consistent establishment classification would be preferable but has not been carried through partly because of conceptual difficulties and partly because the data were not sufficient to make the reallocations in the detail required for the national income tables. However, for the broad industry categories used in this study, profits and capital consumption allowances were distributed by establishment despite the element of arbitrariness involved.

Relationship of real product indexes to other output measures

Measures of the volume of industrial production have been published for many years by various agencies of the Federal government. The following is a brief comparison of the industry gross product data with these other series.

The indexes of industrial production published by the Federal Reserve Board are closely related to but nevertheless different from the data on real product. The FRB indexes for an individual industry represent the total output of that industry whereas the real product measures deduct intermediate purchases. Trends in total output will not be the same as trends in gross product if there are technological or other changes which result in different requirements for purchases of materials.

There are such other differences as (1) FRB indexes cover the output of mining, electric and gas utilities, and manufacturing, while real product encompasses the whole economy; (2) the FRB uses a 1957 weighting pattern for the data since 1952, and other weights for earlier periods; the real product indexes use a 1954 pattern; (3) FRB weights are the Census Bureau value-added weights while the indexes in this study use gross product originating; and (4) FRB methods for measuring the quantity of output in general differ from those used in the calculation of real product. Generally, these differences are more significant at the detailed level than for broad aggregates.

The chart on page 13 shows the manufacturing components of the real GNP and of the FRB index of industrial production. As can be seen from the chart, the broad movements of the two measures are quite similar but there are some differences in year-to-year changes and also for the longer term. In particular, the FRB index has increased more in recent years than its GNP counterpart. The causes of the differences will require detailed investigation. One of them, however, is already apparent and should be noted here.

A large part of the difference in recent years is due to the fact that the gross product originating in manufacturing measured in current dollars (as the sum of employee compensation, corporate profits, etc.) has increased less over this period than the current-dollar value-added compiled by the Census Bureau which underlies the physical quantities providing the FRB index with its benchmark.

In order to derive a series of constant-dollar gross product for manufacturing that is most closely tied to the statistical sources and methods used in calculating the GNP, the following procedure was used: value-added in both current and constant dollars was calculated using Census data, and the implicit price deflators derived from these calculations were applied to current-dollar gross product in manufacturing as included in the national income accounts to derive the manufacturing component of real GNP.

Production indexes have also been prepared by the Bureau of Labor Statistics of the U.S. Department of Labor. As part of its program for the measurement of productivity indexes, the BLS has issued basically two types of production series. The first includes a gross product series for manufacturing similar to that used in this study. There are differences, however, in weighting and detailed methodology. The other series, covering a selected number of industries, provides indexes of total output and do not "net out" intermediate purchases.

The "value-added by manufacture" in current dollars published by the Bureau of the Census of the U.S. Department of Commerce differs from gross product originating in manufacturing. The difference arises primarily because the Census value-added excludes excise taxes paid by the industry and is net only of purchases of materials but not services. The current-dollar gross product estimates exclude all intermediate purchases and include the excise taxes.

The Census Bureau also publishes production index data which represent changes in the quantity of production. These indexes, compiled after each Census of Manufactures since 1947, serve as benchmarks for the FRB annual and monthly indexes and are conceptually consistent with them. That is, they are primarily indexes of total output for individual industries combined to broader industrial groupings using value-added for the base period as weights.

A detailed description of the methods used to prepare the gross product series in current and constant dollars is available upon request to the Office of Business Economics.

New and Revised Series—Building Cost Index: Revised Data for Page S-10 [1]

(1957–59=100)

Year	January	February	March	April	May	June	July	August	September	October	November	December	Monthly average
1920	34.7	35.0	35.0	35.0	34.7	34.7	34.7	34.7	34.2	34.5	34.0	34.7	34.7
1925	34.9	34.8	35.0	34.9	34.8	34.5	35.0	35.1	35.1	35.7	35.7	35.7	35.1
1927	35.6	35.0	35.5	35.3	35.2	36.2	34.9	35.4	35.0	35.4	35.1	35.1	35.3
1928	35.3	35.5	35.5	35.8	36.1	36.0	35.0	35.0	35.6	35.6	35.8	36.0	35.7
1929	36.0	36.0	36.0	36.0	36.3	36.4	36.4	36.6	36.3	36.1	36.1	36.1	36.2
1930	36.1	35.8	36.0	35.8	35.7	35.3	34.8	34.8	34.6	34.5	34.5	34.5	35.2
1931	34.3	34.5	34.2	33.7	33.1	32.2	31.1	30.4	30.4	30.0	29.9	29.3	31.9
1932	28.6	27.9	27.7	27.7	28.9	28.1	26.5	26.4	26.5	26.6	26.6	26.6	26.7
1933	26.7	26.0	26.7	26.8	27.3	27.2	27.6	27.7	29.3	29.8	30.2	30.5	28.0
1934	30.4	30.6	30.7	31.0	31.9	31.9	32.1	32.0	32.3	32.3	32.3	32.3	31.6
1935	31.6	31.4	31.1	31.1	31.0	31.3	31.4	31.6	31.5	31.7	31.7	31.7	31.5
1936	31.8	32.0	32.2	32.3	32.5	32.3	32.4	32.0	33.1	33.6	33.6	34.0	32.7
1937	35.2	35.4	35.6	37.0	37.4	37.8	37.9	38.1	38.1	38.1	38.0	38.0	37.2
1938	37.7	37.8	37.8	37.6	37.5	37.6	37.9	37.9	37.0	37.1	37.1	37.2	37.3
1939	37.2	37.2	37.2	37.3	37.3	37.3	37.3	37.3	37.3	37.7	38.2	38.2	37.5
1940	38.2	38.2	38.2	38.2	38.3	38.3	38.3	38.5	38.6	39.7	39.1	39.5	38.5
1941	39.5	39.5	39.4	39.6	39.7	39.7	39.9	40.3	40.7	41.0	41.1	41.1	40.1
1942	41.2	41.4	41.5	41.7	41.8	42.0	42.1	42.3	42.8	42.9	43.0	43.0	42.2
1943	43.0	43.1	43.0	43.2	43.2	43.2	43.2	43.5	43.9	43.9	43.9	43.9	43.4
1944	43.9	44.0	44.1	44.3	44.5	44.6	44.7	44.9	44.8	44.6	44.5	44.9	44.5
1945	44.9	45.1	45.1	45.2	45.2	45.4	45.4	45.5	45.2	45.6	45.6	45.7	45.4
1946	46.0	46.3	46.4	46.3	46.0	50.3	50.7	51.7	51.7	51.8	52.0	52.1	49.8
1947	53.9	57.2	57.5	57.0	57.5	58.3	58.6	60.3	61.2	62.1	62.5	63.2	59.4
1948	63.3	63.7	63.4	63.5	63.4	64.4	65.0	67.4	67.7	67.7	67.5	67.6	65.4
1949	67.4	67.0	66.9	66.7	66.2	66.3	66.3	66.0	66.3	67.6	67.8	67.6	66.7
1950	67.6	67.6	68.3	68.8	69.1	70.8	71.7	72.7	73.4	73.4	74.0	74.3	71.2
1951	74.6	75.6	75.8	75.9	76.1	76.1	76.0	76.0	75.9	76.5	76.7	77.0	76.0
1952	77.0	77.1	77.3	77.4	77.6	78.3	78.6	80.1	80.5	80.6	80.6	80.6	78.8
1953	80.0	80.7	80.6	80.6	80.8	80.9	82.0	82.9	82.7	82.7	82.7	82.6	81.7
1954	82.8	82.9	82.9	83.0	83.1	83.4	84.3	85.4	86.2	86.4	86.0	86.7	84.6
1955	86.9	87.2	87.2	87.4	87.6	88.2	88.7	90.7	90.9	91.1	90.9	90.9	88.9
1956	91.2	91.7	91.7	92.1	92.5	92.7	92.8	93.3	94.0	94.3	95.6	94.9	93.1
1957	95.2	95.4	95.1	95.1	95.4	95.7	96.1	96.1	97.9	98.1	98.1	98.0	96.5
1958	98.1	97.9	97.9	98.0	98.4	98.9	99.5	99.7	101.5	101.6	101.5	101.5	99.5
1959	101.7	101.9	102.5	103.0	103.3	104.0	104.7	105.3	105.5	105.4	105.1	104.9	103.9
1960	104.2	105.4	105.3	105.5	106.2	106.4	106.7	106.7	106.6	106.5	105.5	106.5	106.1
1961	106.9	106.9	106.8	107.2	108.0	108.2	108.5	108.9	108.4	108.3	108.3	108.2	107.8

[1] Source: Engineering News-Record. Revised to reflect data as of 1st of indicated month and shift to 1957–59 reference base. Monthly averages for 1913–24, respectively, are as follows: 19.0; 17.4; 18.1; 24.8; 31.0; 30.2; 30.1; 29.3; 31.5; 29.4; 38.2; 36.2.